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Cone in cone structures in the Uttattur Formations, Trichinopoly district, Tamil Nadu

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Abstract

Cone in cone structures in Trichinopoly district are seen in the yellowish brown coloured marls which are found associated with the gypsum bearing clay beds of Uttattur Formations of Upper Cretaceous age. These are restricted to an area of about 65 sq. kilometers extending from Tappay in the south to Odiyam in the north. Field observation suggests that cone in cone bearing marls may have a lithological control over the distribution and concentration of gypsum in the Uttattur beds.

Introduction

Cone in cone is a post depositional structure found in calcareous clays and rarely in coal. In the Trichinopoly district, the cone in cone structures are found well developed in the yellowish brown coloured marl beds which are found associated with gypsum clays. The cone in cone bearing marls are of no economic value since they are very thin and constitute less than 5% of the gypsum clays, although they contain 75% of $CaCO_3$. A sample of such a marl collected from Tappay has the following chemical composition:

		Wt.%
SiO_2	...	9.72
Al_2O_3	...	4.52
Fe_2O_3	...	4.00
CaO	...	44.75
MgO	...	0.77
L. O. I.	...	36.26
Total	...	100.02

In India, Chandra and Gupta, 1973 have described these structures from the coal field of Western Bokaro. Perhaps this is the first report of the occurrence in India. Kumar *et al.* 1978 have reported such structures from the upper flysch series (Upper Cretaceous) of Malla Johar in Uttar Pradesh.

Mode of occurrence in Trichinopoly District

In the Trichinopoly district, cone in cone structures are found in marls associated with gypsious clays of the Uttattur stage of Upper Cretaceous. They are generally seen on the weathered surface of the undulating bad land topography of the Uttattur Formations which have a lateral extent of 65 Sq km from Tappay in the south to Maravathur in the north (Map 1). The cone in cone structures are found only in marls. The thickness of the individual marl beds vary from 30 to 60 cm. Because of the undulating topography the marls appear to dip at different angles at different places in the same locality. But the general dip direction is towards north-east at angles varying from 15° to 45°.

At first sight, for an unfamiliar eye, these cone-in-cone structures can be easily mistaken for some fossil impressions (Fig. 1).

Field observations indicate that the cone in cone structures are not seen in all the marl beds found in gypsious clays. They are also absent in the marls found in the subsurface.

The cones are essentially made up of fibres of calcite which are arranged parallel to the conical axis. At the apex some of the calcite fibres get distorted due to crowding and overlapping and often this distortion of the fibres is mistaken for folding.

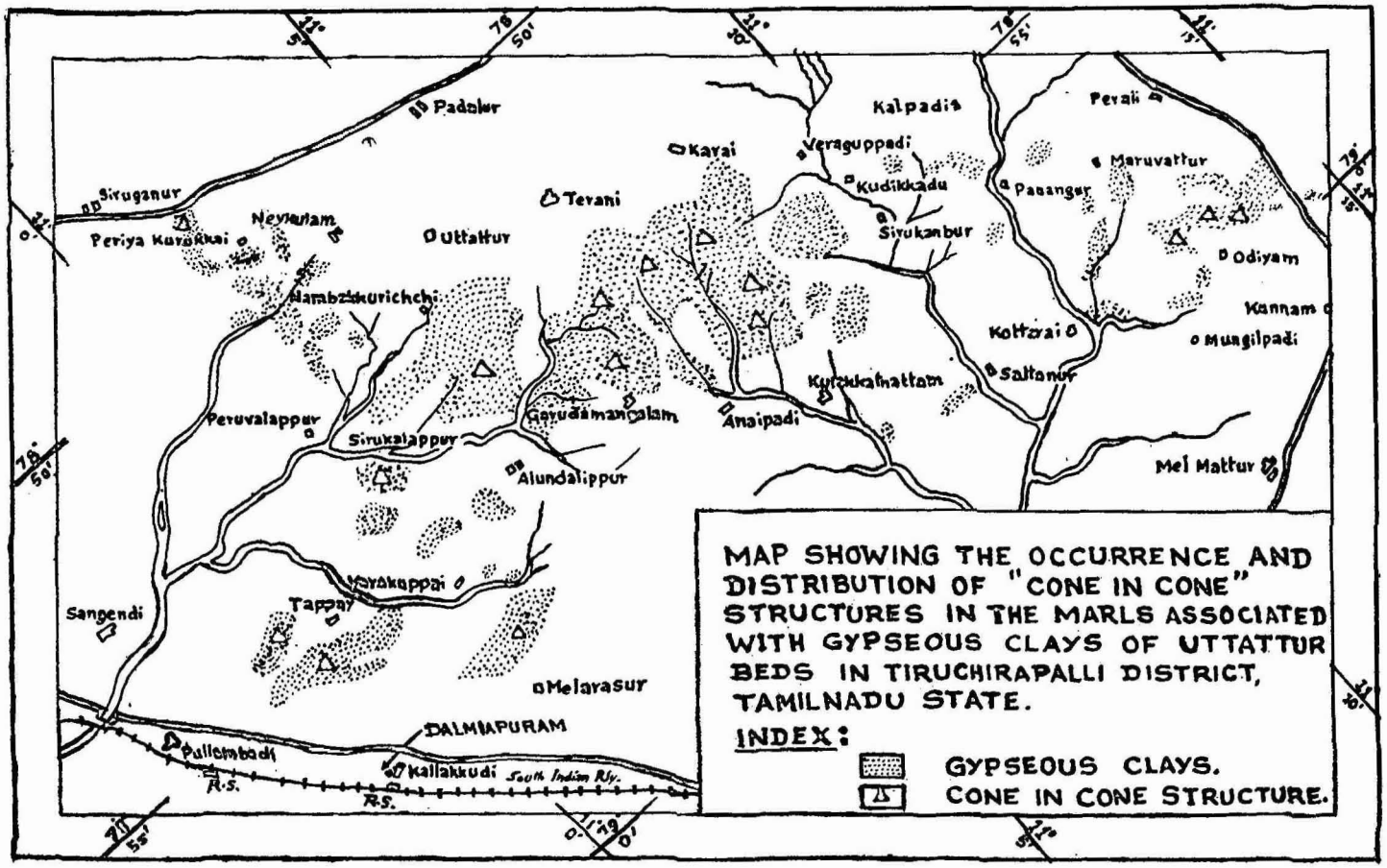
Figure 1. A typical cone in cone structure showing the cones and ribbed structures. From Tappay gypsum mines area.

The cones generally occur in clusters and are found united so that the base of the cone laminations are curved and on a weathered surface they are seen as parallel concentric rings and ridges. A number of secondary and tertiary cones are seen within the primary cone.

Economic significance of the marls

These marls and the associated gypsum are genetically related to each other. Both are products of evaporation and chemical precipitation in a relict sea.

Field observations indicate that although gypsum is seen over an extent of 65 sq km, the economically workable gypsum deposits and concentrations are restricted to few localities only. At these places invariable marl beds with cone in cone structures are seen. In other words wherever marls with cone-in-cone structures are seen, gypsum is sure to be found in economically workable quantities.



SCALE : 1 : 200000 OR
1" = 3 MILES (APPX.)

References

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OBITUARY

S. SURYAPRAKASA RAO
(1946—1979)

It is with deep regret I have to record the sudden and premature death of Sri S. Suryaprakasa Rao, Assistant Geologist, Groundwater Survey and Development Agency, Buldana, Maharashtra, on the 20th May 1979 at the young age of 33. Sri Rao was travelling in a truck belonging to a Drilling Company. The truck got involved in a road accident and Sri Suryaprakasa Rao died on the spot.

Sri Suryaprakasa Rao took his M.Sc. degree from the Bangalore University in 1967 topping the list of successful candidates in Geology. He worked as a CSIR Research Fellow for about three years at the Department of Geology, Central College, Bangalore studying the high grade metamorphic rocks of the Bandihalli region in Kunigal district, Karnataka. He had almost completed his work for the Ph.D. dissertation when he left the Department.

Sri Rao joined the Directorate of Groundwater Surveys and Development, Government of Maharashtra as Geological Assistant. By his hardwork he impressed his superiors and he was promoted to the gazetted rank after a short span of only eight months. This was a rare achievement for a youngster. At the time of his sad demise, Rao was engaged in the project investigation of experimental verification of groundwater movement and recharge.

Sri Rao was a man of few words but was very social in the company of his close friends. He was gentle and soft spoken but was firm when it came to expression of views on controversial matters. He would never yield easily in arguments. All his friends without exception had the highest regard for his intellectual capacity. Sri Rao became a Fellow of the Geological Society of India in 1972. He was also a Fellow of the Mineralogical Society of India. Unmarried, Rao leaves behind his aged parents and a large circle of friends to mourn his loss.

V. N. VASUDEV